

CLAIMS

What is claimed is:

1. A system for generating hydrogen gas for use in a fuel cell, comprising:
a powder metal hydride source;
a water source;
a mixing device; and
a catalytic hydrogen generating chamber.
2. A method of generating hydrogen for use in a fuel cell, comprising the steps of:
providing a source of dry metal hydride fuel;
providing a source of steam;
providing a mixing chamber operably connected to the source of dry metal hydride fuel and the source of steam;
transporting dry metal hydride fuel and steam into the mixing chamber to initiate a hydrogen-producing reaction;
removing a dry metal powder byproduct from the mixing chamber; and
removing hydrogen from the mixing chamber.
3. The method of claim 2, wherein the mixing chamber comprises a screw drive transporter connected at a first end to the source of dry metal hydride fuel.
4. The method of claim 3, wherein the mixing chamber is connected at a second end to the source of steam.
5. The method of claim 4, further comprising the step of operating the screw drive to transport the dry metal hydride fuel from the first end to the second end.
6. The method of claim 5, further comprising the step of feeding steam into the mixing chamber at the second end to pass through the metal hydride fuel toward the first end.

7. The method of claim 3, wherein the mixing chamber is further connected at the first end to the source of steam.
8. The method of claim 7, further comprising the step of operating the screw drive to transport the dry metal hydride fuel from the first end to the second end.
9. The method of claim 8, further comprising the step of feeding steam into the mixing chamber at the first end to pass through the metal hydride fuel toward the second end.
10. The method of claim 2, wherein the dry metal hydride fuel is selected from the group consisting of calcium hydride, lithium hydride, lithium borohydride, magnesium hydride, sodium hydride and sodium borohydride.
11. The method of claim 10, wherein the screw drive is coated with a catalyst for initiating the reaction between the steam and the dry metal hydride fuel.
12. A method of generating hydrogen for use in a fuel cell, comprising the steps of:
 - providing a source of dry metal hydride fuel;
 - providing a source of steam;
 - providing a screw drive transporter connected at a first end to the source of dry metal hydride fuel and at a second end to the source of steam;
 - operating the screw drive to transport the dry metal hydride fuel from the first end to the second end, and feeding steam at the second end to pass through the metal hydride fuel toward the first end, such that the steam reacts with the dry metal hydride fuel to produce hydrogen gas and a dry metal powder byproduct;
 - removing the dry metal powder byproduct at the second end of the screw drive; and
 - extracting the hydrogen gas at the first end of the screw drive.
13. The method of claim 12, wherein the dry metal hydride fuel is selected from the group consisting of calcium hydride, lithium hydride, lithium borohydride, magnesium hydride, sodium hydride and sodium borohydride.

14. The method of claim 13, wherein the screw drive is coated with a catalyst for initiating the reaction between the steam and the dry metal hydride fuel.